

## ABSTRACT

An apparatus and method for analyzing the performance of a mechanical system having two identical rotating members therein is disclosed. Light is directed from two identical light sources to intercept encoded portions of the rotating members. A portion of the light is reflected from the encoded portions of each rotating member. The reflected portion of the light can be then detected to recover performance data maintained therein, wherein the performance data contains performance characteristics of the mechanical system. A mechanism for reflecting a portion of the light from the encoded portions of the rotating members is also provided. A reflected portion of the light can be detected to recover performance data. The light sources can be configured as Vertical Cavity Surface Emitting Laser (VCSEL) units. The encoded portions of rotating members thereof may comprise a bar code. Images from a first encoded surface may interact with an image from a second encoded surface after the light beams are reflected off the first and second rotating surfaces to produce Moirè fringes.